



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY


REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

JAN 28 2004

Missouri Electric Works
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MEMORANDUM

SUBJECT: Review of the Draft Baseline Human Health Risk Assessment
Missouri Electric Works (MEW) Site
Cape Girardeau, Missouri

FROM: Jeremy Johnson 
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TO: Pauletta France-Isetts
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SUPR/MOKS

As requested, I have reviewed the Draft Baseline Human Health Risk Assessment (BLRA) for the Missouri Electric Works (MEW) Site, dated December 17, 2003. The review of the document assumes the groundwater and vapor intrusion modeling are technically sound. Below I have provided comments on the document. Please contact me at extension #7510 if you have any questions or need clarification on the comments.

General Comments

1. The target Hazard Index (HI) for Region 9 Preliminary Remediation Goals (PRGs) is 1. To account for the potential additivity of non-cancer health effects, non-carcinogenic compounds should be screened against risk-based standards with a HI of 0.1. The BLRA should be revised accordingly.
2. While it is not a significant issue in the BLRA, the Region 9 PRGs should not be used as the definitive source of the latest provisional toxicity values. While many of the provisional values are accurate, some have been vacated, others replace values that are still published in the Integrated Risk Information System, and some are route-to-route extrapolations. Therefore, Region 7 should be contacted for the latest provisional values.
3. In several instances, the BLRA provides exposure parameters in non-metric units. For example, the surface area for an adult is given in square feet. For consistency with risk assessment guidance, exposure parameters, where applicable, should be provided in metric units.

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4. MEW should evaluate the vapor intrusion pathway in accordance with the *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway From Groundwater and Soils (Subsurface Vapor Intrusion Guidance)*, dated November 2002.

5. Health risks associated with the recreational/trespasser use of creek water scenario are presented independently and in combination with the residential scenario. However, the BLRA does not clearly define the recreational/trespasser scenarios. This potentially exposed population should be clearly defined in the BLRA. See Specific Comments 19 and 20.

Specific Comments

1. **Executive Summary, Page V, Paragraph 2.** This paragraph vaguely lists the conclusions from the risk assessment. For example, the second conclusion states “There is no significant risk to residents in the wetland area that use either municipal water or non-impacted groundwater for water supply.” While this conclusion is addressing the indoor air and recreation pathways, it is not clearly stated. As a result, it could be interpreted as there are no significant risks with drinking municipal water or non-impacted groundwater. The BLRA should clearly present exposure pathways that were evaluated under each conclusion.

2. **Section 3.2, Page 15, Paragraph 2.** This paragraph states that no screening value is available for naphthalene. The Region 9 PRG table does provide a tap water screening value for naphthalene. A concentration of 6.2 µg/L is listed under the Polynuclear Aromatic Hydrocarbons heading. This value should be adjusted to account for an HI of 0.1.

3. **Section 3.2, Page 16, Paragraph 1.** This paragraph should be revised to state that a sample with a “J” flag concentration for chloromethane was detected in September 2003. Also, only one October 2003 sample had a “J” flagged detection of chloromethane.

4. **Section 3.2, Page 17, Paragraph 1.** N-Nitrosodi-n-propylamine is screened out of the assessment due to low frequency of detection. While it was only detected in 2 out of 168 samples it is worth mentioning that the laboratory quantitation limit is 10 µg/L and the screening concentration is 0.0096 µg/L. Given the quantitation limit is several orders of magnitude greater than the screening level, this chemical may need to be retained in the BLRA. The selection or removal of this chemical should be re-evaluated using the approach provided in Exhibit 5-1 of *Risk Assessment Guidance for Superfund (RAGS) Volume I Human Health Evaluation Manual (A)*. More justification should be provided if N-nitrosodi-n-propylamine is to be screened out of the BLRA.

5. **Section 3.2, Page 17, Paragraph 2.** Bis(2-ethylhexyl)phthalate is screened out of the BLRA due to sporadic detections and because it is a plasticizing agent. However, detected concentrations do exceed screening levels and the compound has been detected in several monitoring wells. Although this compound may be an artifact from the plastic products

associated with the monitoring wells it should be retained in the BLRA. Uncertainties regarding the source of this compound should be addressed in the uncertainties section of the BLRA.

6. **Section 3.2, Page 17, Paragraphs 3 and 4.** These sections provide the rationale for eliminating Aroclor 1260 (filtered and unfiltered) from the BLRA. For example, unfiltered Aroclor 1260 is screened out due to a lack of mobility in the vapor or dissolved phase. However, the concentration of unfiltered and filtered Aroclor 1260 have been above their respective screening levels. Also, Table 3-2 indicates they were retained as COPCs. Given this information and the fact that soils on site had been contaminated with PCBs, the BLRA should retain PCBs as chemicals of potential concern in groundwater. The mobility of PCBs in the subsurface should be considered when modeling groundwater exposure point concentrations, not for screening them out of the risk assessment.

7. **Section 5.3.3.1, Page 27, Paragraph 4.** This paragraph states “Use of groundwater for irrigation or as drinking water for animals is considered highly unlikely...” Region 7 recommends MEW to either eliminate this paragraph or provide additional discussion on the elimination of these pathways rather than simply stating their occurrence is “highly unlikely.” A brief discussion on why these exposure pathways are not likely to occur would suffice. Also, a link between the animal and irrigation scenarios and human health should be provided.

8. **Section 5.3.3.2, Page 28, Paragraph 2.** The last sentence starting with “The U.S. EPA has recommended....” is not necessary and should be removed. However, the preceding statements should be cited appropriately.

9. **Section 5.3.4, Page 30, Paragraph 1.** The statement that workers will be “directly exposed to chemicals in groundwater via skin contact” should be removed.

10. **Section 6.1.1, Page 32, Paragraph 3.** This paragraph states the maximum concentrations of TCE in on-site groundwater have consistently been detected in MW-10. However, the concentration used for screening was from MW-16C. See Specific Comment #11.

11. **Section 6.2.2.2, Page 39, Paragraph 1.** This paragraph states that the EPM model under-predicts the concentration of TCE detected in MW-16B and MW-16C, where approximately 9 µg/L TCE has been detected. It is not clear why MEW opted for concentrations from a model over an actual off-site detection of TCE. The BLRA should use the data from MW-16C as opposed to using the hypothetical well data. Note, the model predicted non-detects for all COPCs at hypothetical well C. It is Region 7's opinion that a drinking water well could just as easily be installed in the vicinity of MW-16C as is the location of hypothetical well C. Uncertainties associated with the source of TCE in MW-16B and MW-16C should be discussed in the BLRA.

12. **Section 6.2.3.1, Page 40, Paragraph 1.** The first sentence should be revised to state “...constructed over contaminated soils and groundwater.”

13. **Section 6.2.3.2, Page 44, Table H.** Predicted indoor air concentrations are provided in $\mu\text{g}/\text{ft}^3$. Concentrations should be presented in $\mu\text{g}/\text{m}^3$.
14. **Section 7.1.4.1, Page 49, Paragraph 1.** This paragraph incorrectly cites the USEPA Exposure Factors Handbook (i.e., the date of publication). Also, RAGS Part A should be cited as a primary source for exposure factors.
15. **Section 7.1.4.1, Page 49, Table J.** The BLRA should use an inhalation rate of $20 \text{ m}^3/\text{day}$ (per shift) for an adult worker, assuming heavy activity.
16. **Section 7.1.4.2, Page 49, Paragraph 1.** See Specific Comment #14.
17. **Section 7.1.4.2, Page 51, Table K.** The BLRA should use an ingestion rate of $2 \text{ L}/\text{day}$ for an adult and $1 \text{ L}/\text{day}$ for a child. Also, although it was presented before without objection, the BLRA should assume that the adult resident and child resident will be exposed 24 hours per day; therefore, adjusting inhalation rates by using exposure time is not necessary. Instead, uncertainties regarding exposure time should be addressed in the uncertainties section.
18. **Section 7.2.2.1, Page 54, Paragraph 5.** This section states that ILCR has been summed for the child and adult resident. While age-adjustment is calculated for carcinogenic risk, this section and other relevant tables and sections should clearly define age-adjustment. The BLRA should state that carcinogenic risks were calculated for a 30-year exposure duration including 6 years as a child and 24 years as an adult.
19. **Section 7.3.2, Pages 56 - 57, Tables M, N, and O.** The total hazard index and ILCR for hypothetical well C are presented in tables M and N. Table O also shows the relative contribution of health risks from each hypothetical well including C. However, it is not clearly understood why these risks are presented under hypothetical well C since these health risks are associated with the indoor air and recreational use of surface water pathways. Contaminants are not expected to be detected in hypothetical well C as the EPM model predicts. For transparency, health risks posed by these pathways should be put under their respective pathways and not under hypothetical well C.
20. **Section 7.3.2, Page 58, Paragraph 1.** This paragraph presents the range of cancer risks for hypothetical well location C. Classifying these health risks under the hypothetical well location C is confusing and not consistent with earlier sections of the BLRA. For transparency, the risks should be presented under the recreational use of surface water and indoor air pathways.
21. **Table 3-2.** This table lists the highest detected concentration for each chemical of potential concern (COPC) in groundwater. However, after comparing these concentrations to the concentrations listed in Table 3-1, this table does not list the highest detected concentration for some COPCs. For example, Table 3-2 lists a maximum concentration of $9.9 \mu\text{g}/\text{L}$ for TCE, but

the maximum concentration listed in Table 3-1 is 13 µg/L. MEW should revise Table 3-2 so that it lists the maximum detected concentrations for all COPCs.

22. **Table 4-2.** The BLRA uses a route-to-route extrapolation to derive an inhalation reference dose (RfD) for 1,3-dichlorobenzene. Except in certain circumstances (i.e., trichloroethene), EPA Region 7 does not recommend using route-to-route extrapolations to derive toxicity values when estimating health risks. Instead, uncertainties associated with a lack of toxicity values for chemicals of potential concern should be discussed in the uncertainties section.

23. **Tables 4-3 and 4-4.** The oral cancer slope factor and inhalation unit risk for tetrachloroethylene should be revised. OSWER Directive 9285.7-74, dated April 25, 2003, provides an oral slope factor of $5.1\text{E-}02 \text{ (mg/kg-day)}^{-1}$ and an inhalation unit risk of $5.9 \text{E-}06 \text{ (}\mu\text{g/m}^3\text{)}^{-1}$.

24. **Table 4-3 and 4-4.** A Weight of Evidence/Cancer Guideline Description of “A” is given to trichloroethene (TCE). TCE has not been classified as a known human carcinogen. For consistency with the August 2001 Trichloroethylene Health Risk Assessment, the classification of “A” should be removed. Instead, the following language should be used to describe TCE’s weight of evidence for carcinogenicity. According to the *Guidelines for Carcinogen Risk Assessment (Draft)*, dated July 1999, TCE is characterized as highly likely to produce cancer in humans.